

Customs Service

[T.D. 87-136]

Recordation of Trade Name; "Two's Company"**AGENCY:** U.S. Customs Service, Treasury.**ACTION:** Notice of recordation.

SUMMARY: On August 3, 1987, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "TWO'S COMPANY" was published in the Federal Register (52 FR 28774). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation and received not later than October 3, 1987. No responses were received in opposition to the notice.

Accordingly, as provided in § 133.14, Customs Regulations (19 CFR 133.14), the name "TWO'S COMPANY" is

recorded as the trade name used by Two's Company, a corporation organized under the laws of the State of New York, located at 33 Bertel Avenue, Mount Vernon, New York 10550. The trade name is used in connection with the following merchandise manufactured in Japan, Hong Kong and Taiwan: Acrylic and glass vases; stirrers; glass picture frames; glass products; floral accessories; commercial flowers containers; Christmas ornaments; silver and silver plated products; napkin rings and vinyl products.

DATE: November 9, 1987.**FOR FURTHER INFORMATION CONTACT:**

Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Avenue, NW., Washington, DC 20229 (202-566-5765)

Dated: November 3, 1987.

Jerry Laderberg,

Acting Chief, Entry, Licensing and Restricted Merchandise Branch.

[FR Doc. 87-25920 Filed 11-6-87; 8:45 am]

BILLING CODE 4820-02-M

UNITED STATES INFORMATION AGENCY**United States Advisory Commission on Public Diplomacy; Meeting**

The United States Advisory Commission on Public Diplomacy will conduct a meeting in Room 600, 301 4th Street, SW. on November 17 from 11:00 a.m. to 12:30 p.m.

The meeting will be closed to the public because it will involve a discussion of classified information relating to USIA's planning for a U.S.-Soviet Summit, foreign public opinion, and the INF agreement. (5 U.S.C. 552b(c)(1))

Please call Gloria Kalamets, (202) 485-2468 for further information.

Marvin Stone,

Acting Director.

Dated: November 3, 1987.

[FR Doc. 87-25863 Filed 11-6-87; 8:45 am]

BILLING CODE 8230-01-M

Sunshine Act Meetings

Federal Register

Vol. 52, No. 216

Monday, November 9, 1987

This section of the FEDERAL REGISTER contains notices of meetings published under the "Government in the Sunshine Act" (Pub. L. 94-409) 5 U.S.C. 552b(e)(3).

FARM CREDIT ADMINISTRATION

Correction of Sunshine Act Notice

SUMMARY: Pursuant to the Government in the Sunshine Act (5 U.S.C. 552b(e)(3)), the Farm Credit Administration gave notice on October 30, 1987 (52 FR 41799) of the regular meeting of the Farm Credit Administration Board (Board) scheduled to be held on Tuesday, November 3, 1987. This notice is to revise the agenda for that meeting to include an additional item in the closed portion.

DATE AND TIME: The meeting was held at the offices of the Farm Credit Administration in McLean, Virginia, on November 3, 1987, from 10:00 a.m. until such time as the Board concluded its business.

FOR FURTHER INFORMATION CONTACT: David A. Hill, Secretary of the Farm Credit Administration Board, 1501 Farm Credit Drive McLean, Virginia 22102-5090, (703) 883-4003.

ADDRESS: Farm Credit Administration, 1501 Farm Credit Drive, McLean, Virginia 22102-5090.

SUPPLEMENTARY INFORMATION: Parts of the meeting of the Board were open to the public (limited space available), and parts of the meeting were closed to the public. The agenda for Tuesday,

November 3, is revised to include the following item:

1. Litigative Matters.¹

Dated: November 4, 1987.

David A. Hill,

Secretary, Farm Credit Administration.

[FR Doc. 87-25915 Filed 11-5-87; 8:52 am]

BILLING CODE 8705-01-M

FEDERAL TRADE COMMISSION

TIME AND DATE: 10:00 a.m., Wednesday, November 4, 1987.

PLACE: Room 532, Federal Trade Commission Building, 6th Street and Pennsylvania Avenue NW., Washington, DC 20580.

STATUS: Open.

MATTER TO BE CONSIDERED:

Consideration of letter from American Optometric Association concerning oral presentations on Eyeglasses II rulemaking proceeding.

CONTACT PERSON FOR MORE

INFORMATION: Susan B. Ticknor, Office of Public Affairs: (202) 326-2179, Recorded Message: (202) 326-2711.

Benjamin I. Berman,

Acting Secretary.

[FR Doc. 87-25939 Filed 11-5-87; 9:18 am]

BILLING CODE 6750-01-M

¹ Session closed to the public—exempt pursuant to 5 U.S.C. 552b(c)(10).

SECURITIES AND EXCHANGE COMMISSION:

Agency Meeting

"FEDERAL REGISTER" CITATION OF PREVIOUS ANNOUNCEMENT: (52 FR 42174 November 3, 1987).

STATUS: Closed meeting.

PLACE: 450 5th Street, NW., Washington, DC.

DATE PREVIOUSLY ANNOUNCED:

Thursday, October 29, 1987.

CHANGES IN THE MEETING: Additional item.

The following additional item was considered at a closed meeting on Tuesday, November 3, 1987, at 12:00 noon.

Legislative matter relating to enforcement program.

Commissioner Fleischman, as duty officer, determined that Commission business required the above change.

At times changes in Commission priorities require alternations in the scheduling of meeting items. For further information and to ascertain what, if any, matters have been added, deleted or postponed, please contact: Judith Axe at (202) 272-2092.

Jonathan G. Katz,

Secretary.

November 4, 1987

[FR Doc. 87-25979 Filed 11-5-87; 2:08 pm]

BILLING CODE 8010-01-M

Corrections

Federal Register

Vol. 52, No. 216

Monday, November 9, 1987

This section of the FEDERAL REGISTER contains editorial corrections of previously published Presidential, Rule, Proposed Rule, and Notice documents and volumes of the Code of Federal Regulations. These corrections are prepared by the Office of the Federal Register. Agency prepared corrections are issued as signed documents and appear in the appropriate document categories elsewhere in the issue.

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. G-6355-001, et al.]

Conoco, Inc., et al.; Applications for Certificates, Abandonments of Service and Petitions to Amend Certificates

Correction

In notice document 87-23863 beginning on page 38262 in the issue of Thursday,

October 15, 1987, make the following correction:

On page 38263, in the table, in the first column, in the first line, the docket number should read "C187-905-000".

BILLING CODE 1505-01-D

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket Nos. ER88-16-000, et al.]

Georgia Power Co. et al.; Electric Rate and Corporate Regulations Filings

Correction

In notice document 87-24412 beginning on page 39268 in the issue of Wednesday, October 21, 1987, make the following correction:

On page 39269, in the first column, the seventh line should read "[Docket No. EC88-2-000]".

BILLING CODE 1505-01-D

DEPARTMENT OF THE TREASURY

Internal Revenue Service

[Delegation Order No. 209 (Rev. 3)]

Delegation of Authority

Correction

In notice document 87-23565 appearing on page 39765 in the issue of Friday, October 23, 1987, make the following correction:

In the first column, under **SUMMARY**, in the 10th line, "partnership of" should read "partnership or".

BILLING CODE 1505-01-D

14 CFR Part 25

Monday
November 9, 1987

Part II

Department of Transportation

Federal Aviation Administration

14 CFR Part 25

Standards for Approval of an Automatic
Takeoff Thrust Control System (ATTCS);
Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. 24046, Amendment No. 25-62]

Standards for Approval of an Automatic Takeoff Thrust Control System (ATTCS)

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment provides new airplane and equipment airworthiness standards for the installation of an automatic takeoff thrust control system (ATTCS) on Part 25 transport category airplanes. As the current regulations do not provide airworthiness standards for this novel and unusual system, special conditions have been developed and issued to provide appropriate standards for installation of the system. This amendment eliminates the need for special conditions.

EFFECTIVE DATE: December 9, 1987.

FOR FURTHER INFORMATION CONTACT: James Walker, Transport Standards Staff, ANM-110, Aircraft Certification Division, FAA, Northwest Mountain Region, 17900 Pacific Highway South, C-68966, Seattle, Washington 98168; telephone (206) 431-2116.

SUPPLEMENTARY INFORMATION:

Background

Initial development of ATTCS special conditions began in the latter part of 1976. At that time, several airplane manufacturers were known to be interested in such a system or had made application for approval of such a system.

With an ATTCS installed, takeoffs would normally be made with all-engine thrust set at less than the maximum certificated takeoff thrust approved for the airplane. The ATTCS actuates in the event of an engine failure during takeoff to automatically apply maximum takeoff thrust to the remaining operating engine(s). An airplane with such a system installed would have a number of novel and unusual design features that are not presently addressed by the regulations. As such, §§ 21.16 and 21.101 of Part 21 require that special conditions be developed and compliance with the special conditions be demonstrated. Special conditions were, therefore, developed for each applicant requesting approval of an ATTCS installation to cover the change in the airplane type design. Note that the term "thrust" is used throughout the discussion even

though the normal nomenclature for turbojet is thrust and for turbopropeller is power. No distinction is made in the discussion and "thrust" is used for both.

In November 1977 proposed special conditions for an ATTCS for any two or three engine turbine-powered transport category airplane were developed and sent to interested aviation groups and various foreign civil aviation authorities for review and comment. Comments were reviewed, and the special conditions were revised and sent out for comment in May 1978 and again in November 1978. Cooperating with the FAA in this development were the Aerospace Industries Association of America (AIA), Air Transport Association of America (ATA), Airline Pilots Association (ALPA), Allied Pilots Association (APA), Rolls Royce (RR), Hawker Siddeley Aviation, Ltd. (HS), British Civil Aviation Authority (CAA), civil aviation authorities of Australia and Japan, the French Technical Commission Navigation (FTCN), the French civil aviation authorities, Lockheed, Boeing, McDonnell Douglas, and Rockwell International. As a result of this effort, essentially identical special conditions were issued to all applicants.

The requirements adopted by this amendment incorporate into Part 25 the substance of the special conditions that have been developed and issued to date. Future applicants who wish to install an ATTCS system will have appropriate rules for designing their systems without the need to go through the special condition development process. As in the special conditions, the amendment herein specifies limits on the maximum thrust increment which can be applied to the operating engines by the ATTCS system; prescribes ATTCS system reliability; requires system status monitoring; requires provisions for manual selection of the maximum takeoff thrust approved for the airplane; prohibits approval of the ATTCS system design if the automatic or manual application of maximum takeoff thrust would result in exceeding engine operating limits; and requires an independent engine failure warning indication if the inherent operating characteristics of the airplane do not provide a clear warning to the crew.

In addition, a "critical time interval" definition is included to provide a uniform and acceptable basis for probability calculations.

The basis for this amendment is the special conditions developed for the Boeing 727 and Douglas DC-9 ATTCS designs. The ATTCS installed and approved on those airplane models involved a relatively simple

electromechanical system integrated with the engines hydromechanical fuel control unit and was designed to increase the thrust a fixed amount. The system was designed to increase thrust only and no other systems or functions beyond the ATTCS could be interfaced with the ATTCS uptrim function nor could the ATTCS be adversely affected if other systems malfunctioned or failed.

Since certification of the original ATTCS however, a number of others have been approved which were required to comply with the same special conditions issued for the earlier ATTCS designs. Some of the more recent ATTCS configurations installed on some of the latest model turbofan and turbopropeller airplanes have been considerably more complex than the ATTCS approved for the Boeing 727 airplane. These systems interface with the latest designed engine electronic fuel control units (ECU) which use microprocessors and digital computers. The electronic controls command fuel flows for a range of thrust from about 50 percent to full rated thrust in some installations and facilitates the ATTCS 10 percent increment which can be a software program within the basic electronic fuel control configuration. Additionally, these electrical or electronic engine controls interface with and are integrated with, in some installations, other critical or essential engine and airplane systems such as autofeathering, autothrottles and in some instances reverser thrust control systems and surge, stall and overspeed protection.

These interfaces and integrated features make the ECU complex in design and difficult to evaluate in light of the performance and other pertinent design criteria used to find compliance with the special conditions and the applicable airworthiness regulations. However, the FAA considers the ATTCS installation an optional appliance, and it is not an item necessary for the basic airplane certification. Therefore, the FAA policy on ATTCS is that regardless of whether the airplane is ATTCS equipped or not, the airplane must be found to comply with the applicable regulations on its own merits and where an ATTCS is installed and integrated the basic airplane airworthiness must not be compromised by the ATTCS installation, and the ATTCS must comply with the requirements of the proposed amendment. This means that the isolation, separation and fail safe concepts in §§ 25.901 and 25.903 must be satisfied regardless of the depth or complexity of the integrated electrical or electronic fuel controls and other critical

or essential airplane systems. The FAA considers the fail-safe means, for these ATTCS applications, to be a fail-fixed condition, in that the design of the ECUs would not cause a downtrim or reduce installed engine thrust by a significant amount.

Discussion of Comments

Notice of proposed rulemaking (NPRM) No. 84-4 was published in the Federal Register on April 27, 1984 (49 FR 18240), for public comment. Notice No. 84-4A was published on July 20, 1984 (49 FR 29410), to allow additional time in which to comment. The following discussion summarizes the comments received from the public, industry and foreign authorities and manufacturers.

One commenter disagrees that the proposed regulations provide a level of safety equivalent to that provided by the applicable regulations for airplanes not having an ATTCS installed, as stated in the NPRM preamble. The commenter further states that the ATTCS is an optional system not required for safety purposes and is installed for economic reasons and if it does not function when needed, a lower level of safety could result under certain circumstances than if it were not installed. The commenter feels the installation of an ATTCS should comply with § 25.1309 and be approved in conjunction with the procedures of Advisory Circular (AC) 25.1309-1, System Design Analysis. The commenter believes system failure of the ATTCS should be shown to be extremely improbable to provide the same level of safety under all conditions as if the system were not installed.

This amendment provides equivalent safety since a combined failure of the ATTCS and an engine during the critical time interval must be extremely improbable and the failure of the ATTCS to insert thrust during this critical time interval must be improbable. Under the provisions of this amendment, which are consistent with § 25.1309, it must be extremely improbable that an ATTCS-equipped airplane would fail to meet Part 25 performance flight path requirements below 400 feet. Even in the event of a combined ATTCS failure and loss of one engine, which is extremely improbable, the airplane would be able to continue flight and land since the limit on initial takeoff thrust levels provide assurance that sufficient pilot reaction time will be available to advance the thrust. This limit would prevent penetration of the Part 25 net flight path above 400 feet and would assure that the limiting initial takeoff thrust assures a positive climb gradient.

The same commenter states that the reliability criteria of the ATTCS should be based on the categorical assumption of engine failure like many other system design requirements of Part 25. The reliability criteria imposed on the ATTCS is consistent with the requirements of § 25.1309 and is based on an assumed engine failure during the critical time interval which is required in this amendment.

The same commenter requests that the proposed standards prohibit performance credit for ATTCS when a "reduced takeoff" thrust procedure is used. The FAA has not approved ATTCS credit with "reduced thrust" operations for the several ATTCS installations approved to date by the special conditions. This amendment makes clear that such credit is not approved by restricting the initial takeoff thrust at the beginning of the takeoff (or at the same point normally used to establish the takeoff thrust for non-ATTCS operations) to not less than 90 percent of the maximum takeoff thrust available for the airplane under the existing ambient day conditions.

The same commenter requests that procedures be adopted to prohibit performance credit to increase takeoff gross weight when the system is used on contaminated runways. The FAA does not agree. The provisions of the amendment and of Part 25 regarding accelerate-stop criteria are the same, with the exception that the thrust increase in the interval between engine failure and V_1 due to ATTCS operation must be included in the accelerate-stop distance.

Another request from the same commenter recommends a maximum crosswind be specified so that directional control would not be jeopardized by operation of the system. As part of the original or an amended type certificate (TC), the Airplane Flight Manual (AFM) contains a statement of the maximum crosswind as determined by the ground handling characteristic requirements in the current regulations. In addition, all minimum control speeds are based upon the ATTCS operating as intended so the level of safety provided by Part 25 is maintained.

One commenter expresses concern about § 25.904 being sufficiently flexible to allow future flight management systems and performance management systems to be expanded to manage the takeoff functions an ATTCS now performs. A system designed to perform ATTCS and other functions during the takeoff would be acceptable if it can be shown to comply with both the

requirements of this amendment and the requirements for those other functions.

The same commenter recommends that the FAA devise a more objective criterion than the "arbitrary" 10 percent limit. The commenter believes the proposed paragraphs 125.4 (b) and (c) may be sufficient by themselves.

In the special conditions, the FAA adopted the value based on a review of the impact that "reduced thrust" operations had on runway-critical takeoffs. A 10 percent value was determined to be a straightforward and acceptable decrement from a safety standpoint in limiting both runway critical takeoffs and degradation of all-engine climb performance factors that are not addressed by paragraphs 125.4 (b) and (c).

Several commenters recommend expanding the scope of the proposed standards to include such additional maneuvers as: (1) Takeoffs using reduced and derated thrust, (2) thrust reductions during initial climb, and (3) approach climb performance and go-around maneuvers.

The FAA has not restricted ATTCS operations where airplane performance is based on an approved "derate" rating which has corresponding engine and airplane limits approved for use under all weight, altitude and temperature (WAT) conditions. However, the FAA has not allowed the reduced thrust (assumed temperature or weight decrement method) operations to be combined with ATTCS because the resulting flight procedures would increase the pilot workload by creating an infinite number of initial all-engine and engine-failed thrust settings. The increased workload could lead to performance computation errors, and create confusion for the crews workload during a critical high workload engine failure situation. Operationally, noise abatement procedures have already created another set of thrust settings which must be monitored and set. The combination would substantially increase exposure to performance limiting conditions, and this clearly would not be equivalent to current regulations, which are based on a single thrust setting for takeoff. In regard to ATTCS credit for approach climb and go-around maneuvers, current regulations preclude a higher thrust for the approach climb (§ 25.121(d)) than for the landing climb (§ 25.119). The workload required for the flightcrew to monitor and select from multiple in-flight thrust settings in the event of an engine failure during a critical point in the approach, landing, or go-around operation is excessive. Therefore, the

FAA does not agree that the scope of the amendment should be changed to include the use of ATTCs for anything except the takeoff phase.

Several comments suggest changing the word "gross" to "actual" in the definition of the "Critical Time Interval" (paragraph I25.2(b)) and in the illustration depicting the definition.

The FAA concurs since the use of "gross" has apparently created some confusion and the meaning is evidently misleading both in the text and in the illustration. Since the word "gross" does not appear in the referenced regulation § 25.115, the word "gross" has been changed to "actual" in both the textual definition (paragraph I25.2(b)) and the illustration. The word "actual" is used in § 25.115(b), although the procedures to determine the actual flight path are defined by § 25.111.

Two commenters request paragraph I25.1(b) be revised by deleting the phrase, "without requiring any action by the crew to increase thrust or power." One commenter thinks the phrase is misleading because several requirements of Part 25 must be met at the maximum takeoff thrust irrespective of whether action by the crew is necessary to obtain such thrust. The other commenter states all the design and flight requirements must be met with the maximum power attained after ATTCs advance occurs and accelerate-stop distances, all engine takeoff, etc., must be accomplished with the power actually available. The phrase "without requiring any action by the crew" was originally inserted into the previous special conditions for the purpose of emphasizing that the ATTCs must automatically function to insert the thrust increment if an engine fails during the critical time portion of the takeoff. The ATTCs is required to perform automatically without pilot assistance to demonstrate compliance and to be consistent with the requirements of § 25.111(c)(4). The inclusion of this requirement in the rule makes it clear that the system design must not require any pilot action in order to achieve a level of safety that would otherwise be required by Part 25. Amendment 25-54 adopted October 14, 1980, amended § 25.111(c)(4) by specifying that no change in thrust requiring pilot action could be necessary until the airplane is 400 feet above the surface. Since that section applies also to airplanes equipped with an ATTCs, the requirement could be deleted as being redundant, but it is retained to emphasize the automatic feature required in all ATTCs systems presented for approval.

One commenter feels the critical time interval (CTI) definition should be changed to read as follows: "The critical time interval is defined as the time from V_{EF} (engine failure airspeed) to the time at which the airplane is not less than 400 feet height above the takeoff surface in the minimum performance takeoff path determined by § 25.111, with ATTCs operative." The justification given for this comment is that this would result in an increase in the CTI and reflect the requirements of § 25.111, which state that the critical engine is made inoperative at V_{EF} . Therefore, any failure of the ATTCs to operate at that point or later will result in a lower takeoff path than required up to the 400 foot point.

The FAA does not concur. The CTI was defined in terms of V_1 (takeoff decision speed) because engine failure speed V_{EF} does not apply to an all-engine takeoff which is used in determining the interval. The additional one second delay prior to V_1 was added to approximate the time interval between V_{EF} and V_1 . No further change in severity of the rule is warranted.

Three commenters propose changes to paragraph I25.2(c), the definition of "takeoff thrust" or "takeoff power." One comment relates to the commenters proposal, discussed above, to permit broader basic application of ATTCs to reduced thrust takeoffs and approach and landing maneuvers. As discussed above, the FAA denies the request for expansion of the application of an ATTCs to which this comment relates. Two commenters state that the definition is misleading and erroneous. The definition of "takeoff thrust" or "takeoff power" does not, as previously believed, add significantly to the substance of the regulation. The FAA agrees that in light of the comments received the definition as stated may be misleading and therefore, in the interest of clarity paragraph I25.2(c), has been deleted. Minor changes in other sections where the terms "takeoff thrust" or "takeoff power" are used will be made to clarify their usage.

A number of commenters believe the FAA reliability requirements for an ATTCs and the combined engine/ATTCs system failure probability are excessively conservative and do not match the probabilities with the consequences of the failures. The FAA does not agree. The previous special conditions and this amendment to Part 25 were developed using the principles in § 25.1309 because this was considered the most appropriate method of dealing with complex systems. This amendment evolved from the concepts of § 25.1309

which, in part, state that airplane systems must be designed so that the occurrence of any failure condition that would prevent continued safe flight and landing is extremely improbable and that the occurrence of any other failure conditions which would reduce the capability of the airplane or the ability of the crew to cope with adverse operating conditions is improbable. Also considered in the development of the previous special conditions, which are also the foundation of this amendment, were the establishment of safety equivalency and the requirement of § 25.111(c)(4). Thus, in order to provide a level of safety equivalent to that provided by the current regulations, which preclude credit for pilot actions to change thrust below 400 feet, the probability of the concurrent existence of a combined engine/ATTCs failure must be extremely improbable during the critical time interval. If penetration of the actual flight path which is used to determine obstacle clearance margins is extremely improbable, then the probability of penetrating the net flight path will be the same as that provided by current regulations. A high degree of reliability is necessary for the ATTCs itself. If a reliable system is not provided, confidence in the system would be eroded and crews would be reluctant to use the system, thereby negating the advantages provided through the use of the ATTCs. It was decided that the system's probability of failure to insert takeoff thrust or takeoff power, during the critical time interval, should be improbable and the probability of an ATTCs failure causing a thrust reduction, during the critical time interval, should be extremely improbable. As a practical matter, this requirement is not considered overly severe because of the relatively short time period involved in the specified critical time interval. The reliability is also tied to the requirement that the initial takeoff thrust will be limited to 90 percent of the maximum approved takeoff thrust which essentially assures the airplane will remain airborne without immediate crew action. If this assurance were not provided, a higher level of system reliability would be necessary.

Several commenters express concern about the meaning and intent of a new proposed requirement dealing with the loss of thrust during the critical time interval. Other comments state that the purpose of paragraphs I25.3 (a)(3) and (b)(3) was unclear. The FAA agrees that the proposal was not entirely clear as presented in the NPRM. In consideration of the various comments paragraph

125.3(a)(3) of the requirement has been revised to clarify the intent.

After evaluating the several comments in regard to the alternate airplane performance and ATTCS reliability requirements in proposed paragraph 125.3(b), the FAA has decided not to adopt that option in this amendment for the following reasons: (1) Deleting the "(b)" option is not considered a significant change since no previous applicant elected to show compliance with these alternate airplane performance and reliability requirements, (2) the "(b)" option does not properly apply to the older vintage airplanes, and (3) section 21.101 provides the flexibility to prescribe any necessary standards for future applications on previously certificated airplanes. Deletion of paragraph 125.3(b) has also resulted in renumbering other paragraphs.

Proposed paragraph 125.3(a)(3) which is incorporated in this final rule as paragraph 125.3(a)(2) required that inadvertent thrust reductions during critical time interval must be shown to be extremely improbable. The purpose of the additional requirement of proposed paragraph 125.3(a)(3), which has not been incorporated in the previous special conditions, is to address those designs that may want to use the electro-mechanical or servomechanism feature of an engine control system (autothrottles, for instance) to perform the thrust insertion function. The ATTCS currently approved have features that are integral with the engine fuel control for increasing thrust. These features are inherently not susceptible to faults which might cut off all fuel to the engines or retard the thrust. On systems which use autothrottle servo-mechanisms or the like to perform the thrust insertion, obviously, a fault of this nature is unacceptable and would likely result in a catastrophe if fuel were cut or thrust reduced a significant amount. Therefore, this failure condition must be shown to be extremely improbable for all ATTCS designs. "Significant loss or reduction in thrust or power" means an engine thrust loss that is more than two percent of the initially set total approved takeoff thrust for the airplane at existing ambient conditions. The FAA recognizes that an ATTCS system using an integrated autothrottle/servo-mechanism design or similar type of design will inherently have a degree of mechanical tolerance in the rigging of a mechanical designed type and that each engine's thrust control mechanism and system rigging will not be identical to the other engines' control rigging due to

various factors in the maintenance, design, and environmental effects. The allowance of such a decrement is reasonable in consideration of the failure consequences and time duration of the critical stage during the takeoff.

Several commenters reviewed the alternate performance and reliability requirements outlined in paragraph 125.3(b) and have similar views to those presented for paragraph 125.3(a). One commenter suggests the paragraph be deleted entirely as being so unduly complex as to nearly nullify the benefits of ATTCS. Another commenter states the paragraph should be modified to delete the specific numerical reliability requirement since this is not appropriate in a regulation and would likely establish a precedent. The commenter states it does not seem justified to ask for the same low probability of failure in paragraphs 125.3 (a) and (b) for the same failure case and at the same time ask for extra safety margins. For the reasons stated earlier, the FAA has decided not to adopt the alternate airplane performance and ATTCS reliability requirements in this amendment. Therefore, comments concerning that option are no longer relevant and do not require discussion in this preamble.

Several commenters suggest clarifications in paragraphs 125.3(b) (5), (6) and (7). One commenter suggests the paragraph (paragraph 125.3(b)(5)) clarify that the ATTCS operative V_R is maintained and that reduced V_{LOF} and V_2 speeds are acceptable for the unlikely combination failure. These comments have become moot for the reasons stated earlier. Another comment was to change "gross" to "actual" in paragraphs 125.3(b) (6)(i) and (7)(ii). This comment is no longer relevant for the reasons stated earlier.

One commenter questioned the requirements of paragraphs 125.3 (b)(6) and (b)(7) and the relationship of the two paragraphs. This comment is no longer relevant for the reasons stated earlier.

Several commenters believe that the limitation on the amount of allowable thrust reduction in paragraph 125.4(a) is arbitrary; that it treats two engine airplanes differently and unevenly from three and four engine airplanes; that it is a crude and somewhat indirect method to ensure that the all-engine performance is not significantly degraded and that a minimum level of performance is available in the event of a combined engine and ATTCS failure; that it restricts and penalizes the performance of certain engine installations; and that it increases operating costs and engine maintenance

by not permitting "reduced thrust" takeoffs without increasing safety benefits significantly. The FAA does not agree. The specification of a probability of failure requirement without defining a minimum performance level based on the initial thrust setting is inadequate to assure retention of the level of safety now provided by the regulations. Part 25 engine-out climb requirements not only define a level of safety for the engine-out condition but also define the all-engine performance level consisting of the engine-out requirement plus the added performance provided by the additional operating engine(s). Permitting ATTCS equipped airplanes to operate without a minimum performance level defined in terms of the initial takeoff thrust achieved and verified by the flightcrew early in the takeoff run would ignore the fact that the all-engine level of safety is defined by the existing engine-out requirement. Infringing on this relationship would violate the intent of the regulations. The 90 percent limitation is appropriate and lends itself to a simple, straightforward method for assuring a safe all-engine takeoff in lieu of a more complex performance procedure.

One commenter suggests a revision to paragraph 125.5(b)(1) which would make this paragraph consistent with a previous suggestion which proposed expanding the scope of the amendment. The FAA previously stated that the change was not appropriate and the commenter has presented no new information to alter that determination.

Two commenters disagree with the requirements of paragraph 125.5(b)(2) which require that the means used or allowed to be used to increase thrust, i.e., an override, must be located on or forward of the thrust levers. They disagree this location is necessarily optimum. One commenter believes the objective should be to locate the switch, or means to override, so it is readily accessible and in close proximity to the hand on the thrust levers, preferably close enough so that the hand need not be removed to actuate the switch. The FAA selected the location of the override means as the most practical and convenient under the emergency circumstances likely to exist at the time it is needed. This location is also consistent with the requirements of § 25.777 (a), (b), and (c). The main factors favoring the location "on, or forward" of the thrust lever are the normally forward eye scan pattern and line of vision of the pilot during the takeoff, and the convenience of operation provided in the event the pilot must move his hand from the thrust

levers to use the override means. Generally, the levers are positioned full forward and the instrument panel is near enough so the panel can be used advantageously to mount the override means. With proper design, this also allows the pilot to actuate the device quickly and makes it unnecessary, in some designs, for the pilot to move his hand from the levers. Locations aft of the levers were deemed unacceptable since these locations were not as convenient for operation and did not fulfill the intent of § 25.777.

One commenter suggests deleting "before takeoff" in paragraph I25.5(b)3, which would make the language consistent with another suggestion to expand the scope for using the ATTCS. This suggestion was previously addressed and denied; therefore, the suggestion to delete "before takeoff" is not adopted.

The commenter also suggests changing "verify" to "indicate" in paragraph I25.5(b)(3). A means to verify prior to takeoff that the ATTCS is available when and if needed is considered an important part of the overall system requirements. However, the need for a more specific means of indication is not necessary. The current verification means permits the intent to be accomplished without adding more cockpit "indicators." Reliability is closely related to, although not identical to, probability of availability. Having such means to assure system availability prior to takeoff will inherently minimize the possible inadvertent takeoff with the ATTCS inoperative. This requirement is different from paragraph I25.6(a) which requires an indication that the armed or ready mode of operation has been selected.

One commenter states it is not clear that a means to deactivate the system is necessary or desirable in all instances and recommends the requirement of paragraph I25.5(b)(4) be deleted. The FAA does not agree. A means to deactivate the system is necessary to permit crews to revert to normal procedures in the event of erratic system operation, if ATTCS inoperative takeoffs are made, or if operations using "reduced thrust" procedures (based on the assumed temperature methods), for instance, are scheduled.

One commenter states the requirements for flight characteristics associated with the engine failure are delineated in Part 25 and must be met with or without ATTCS and, therefore, recommends paragraph I25.6(b) be deleted. The intent of this requirement is to provide a warning for the crew that an engine has failed and if the airplane does not yaw, for instance, or provide some other attention getting flight

characteristic, then some other warning means must be available to the pilot to advise him of the engine failure and the need to ensure ATTCS power insertion has been achieved on the operating engine(s).

In addition to the changes discussed above, this final rule incorporates a number of clarifying and editorial changes.

Regulatory Evaluation

As discussed above, special conditions have been issued to several applicants to amend or supplement type certificates held on Part 25 airplanes to permit certification with an ATTCS installed. Such special conditions were granted under authority of the Administrator in accordance with § 21.16 because of the novel or unusual design features associated with the installation of this automated system. The ATTCS design features are no longer deemed to be novel or unusual since the standards for their approval are being incorporated directly into Part 25.

In bringing the requirements of the special conditions into Part 25, the FAA is codifying essentially the same optional certification requirements which have been imposed in the last several years. Because the ATTCS airworthiness standards adopted herein will apply only to applicants seeking certification of designs incorporating an ATTCS, and because such systems are optional and not otherwise required for certification, there is no new requirement established by this amendment and no economic impact results from it.

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress in order to ensure, among other things, that small entities are not disproportionately affected by government regulations. The RFA requires agencies specially to review rules which may have a "significant economic impact on a substantial number of small entities." The regulatory evaluation indicated that there is no economic impact associated with the final rule.

Conclusion

For the reasons discussed earlier, the FAA has determined that this document involves a regulation which is not considered to be significant as defined in Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979), and is not major as defined in Executive Order 12291, and the FAA certifies that this regulation will not have a significant economic impact on a substantial number of small entities since few, if any, small entities are affected.

List of Subjects in 14 CFR Part 25

Aviation safety, Aircraft, Air transportation, Safety, Tires.

Adoption of the Amendment

Accordingly, Part 25 of the Federal Aviation Regulations (FAR) (14 CFR Part 25) is amended as follows:

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. The authority citation for Part 25 continues to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421, 1423, 1424, 1425, 1428, 1429, 1430; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983). 49 CFR 1.47(a).

2. By adding a new § 25.904 to read as follows:

§ 25.904 Automatic takeoff thrust control system (ATTCS).

Each applicant seeking approval for installation of an engine power control system that automatically resets the power or thrust on the operating engine(s) when any engine fails during the takeoff must comply with the requirements of Appendix I of this part.

3. By adding a new Appendix I to Part 25 to read as follows:

Appendix I to Part 25—Installation of an Automatic Takeoff Thrust Control System (ATTCS).

I25.1 General.

(a) This appendix specifies additional requirements for installation of an engine power control system that automatically resets thrust or power on operating engine(s) in the event of any one engine failure during takeoff.

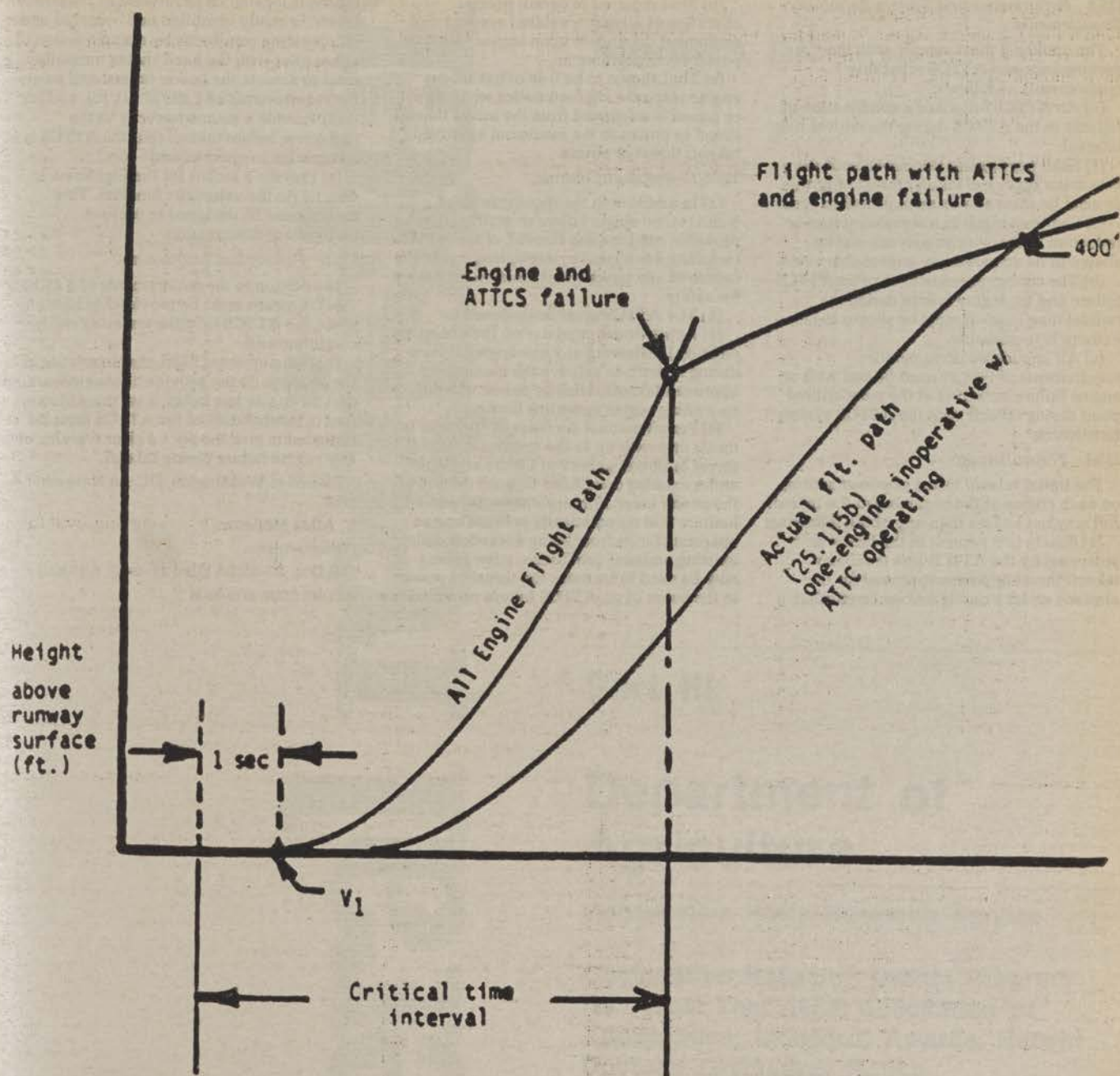
(b) With the ATTCS and associated systems functioning normally as designed, all applicable requirements of Part 25, except as provided in this appendix, must be met without requiring any action by the crew to increase thrust or power.

I25.2 Definitions.

(a) *Automatic Takeoff Thrust Control System (ATTCS)*. An ATTCS is defined as the entire automatic system used on takeoff, including all devices, both mechanical and electrical, that sense engine failure, transmit signals, actuate fuel controls or power levers or increase engine power by other means on operating engines to achieve scheduled thrust or power increases, and furnish cockpit information on system operation.

(b) *Critical Time Interval*. When conducting an ATTCS takeoff, the critical time interval is between V_1 minus 1 second and a point on the minimum performance, all-engine flight path where, assuming a simultaneous occurrence of an engine and ATTCS failure, the resulting minimum flight path thereafter intersects the Part 25 required actual flight path at no less than 400 feet above the takeoff surface. This time interval is shown in the following illustration:

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125.3 Performance and System Reliability Requirements.

The applicant must comply with the performance and ATTCS reliability requirements as follows:

(a) An ATTCS failure or a combination of failures in the ATTCS during the critical time interval:

(1) Shall not prevent the insertion of the maximum approved takeoff thrust or power, or must be shown to be an improbable event.

(2) Shall not result in a significant loss or reduction in thrust or power, or must be shown to be an extremely improbable event.

(b) The concurrent existence of an ATTCS failure and an engine failure during the critical time interval must be shown to be extremely improbable.

(c) All applicable performance requirements of Part 25 must be met with an engine failure occurring at the most critical point during takeoff with the ATTCS system functioning.

125.4 Thrust Setting.

The initial takeoff thrust or power setting on each engine at the beginning of the takeoff roll may not be less than any of the following:

(a) Ninety (90) percent of the thrust or power set by the ATTCS (the maximum takeoff thrust or power approved for the airplane under existing ambient conditions);

(b) That required to permit normal operation of all safety-related systems and equipment dependent upon engine thrust or power lever position; or

(c) That shown to be free of hazardous engine response characteristics when thrust or power is advanced from the initial takeoff thrust or power to the maximum approved takeoff thrust or power.

125.5 Powerplant Controls.

(a) In addition to the requirements of § 25.1141, no single failure or malfunction, or probable combination thereof, of the ATTCS, including associated systems, may cause the failure of any powerplant function necessary for safety.

(b) The ATTCS must be designed to:

(1) Apply thrust or power on the operating engine(s), following any one engine failure during takeoff, to achieve the maximum approved takeoff thrust or power without exceeding engine operating limits;

(2) Permit manual decrease or increase in thrust or power up to the maximum takeoff thrust or power approved for the airplane under existing conditions through the use of the power lever. For airplanes equipped with limiters that automatically prevent engine operating limits from being exceeded under existing ambient conditions, other means may be used to increase the thrust or power in the event of an ATTCS failure provided the

means is located on or forward of the power levers; is easily identified and operated under all operating conditions by a single action of either pilot with the hand that is normally used to actuate the power levers; and meets the requirements of § 25.777 (a), (b), and (c);

(3) Provide a means to verify to the flightcrew before takeoff that the ATTCS is in a condition to operate; and

(4) Provide a means for the flightcrew to deactivate the automatic function. This means must be designed to prevent inadvertent deactivation.

125.6 Powerplant Instruments.

In addition to the requirements of § 25.1305:

(a) A means must be provided to indicate when the ATTCS is in the armed or ready condition; and

(b) If the inherent flight characteristics of the airplane do not provide adequate warning that an engine has failed, a warning system that is independent of the ATTCS must be provided to give the pilot a clear warning of any engine failure during takeoff.

Issued in Washington, DC, on November 4, 1987.

T. Allan McArtor,

Administrator.

[FR Doc. 87-25841 Filed 11-6-87; 8:45 am]

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